

ABSTRACT

A memory element wherein a spin conduction layer having a sufficient spin coherence length and a uniform spin field can be obtained, and thereby practical use is attained and a memory device are provided. A spin conduction layer (paramagnetic layer) (24) is a fullerene thin film being from 0.5 nm to 5 μm thick, for example. The fullerene has a hollow sized, for example, from 0.1 nm to 50 nm. A paramagnetic material is included in this hollow. A fermi vector of the fullerene thin film well laps over small number of spin band or plenty of spin band of a ferromagnetic fixed layer (23) and a ferromagnetic free layer (25). Further, spin orientations of the included paramagnetic material are random. Further, electron spin in the fullerene is in a quantized state in a pseudo zero dimensional space. Thereby, a spin coherence length becomes long in the fullerene thin film, and scatteration of spin-polarized conduction electrons goes away.